

[027] Fig. 2 shows a schematic view of a further preferred embodiment of a multi-step transmission according to the invention; [[and]]

[028] Fig. 3 shows a circuit diagram of the multi-step transmission according to the invention shown in Figs. 1 and 2;

Fig. 4 is a diagrammatic view of an embodiment of the multi-step transmission having a differential;

Fig. 5 is a diagrammatic view of the multi-step transmission with a clutch element and a prime mover;

Fig. 6 is a diagrammatic view of the multi-step transmission located between a starting element and a prime mover;

Fig. 7 is a diagrammatic view of the multi-step transmission for a front-transverse installation with a prime mover;

Fig. 8 is a diagrammatic view of the multi-step transmission with a prime mover and a damper;

Fig. 9 is a diagrammatic view of the multi-step transmission with an auxiliary output for an additional unit;

Fig. 10 is a diagrammatic view of the multi-step transmission having a free wheel;

Fig. 11 is a diagrammatic view of the multi-step transmission with an electric machine;

Fig. 12 is a diagrammatic view of one of the shafts having a retarder; and

Fig. 13 is a diagrammatic view showing the input and the output on the same side of the transmission housing.

[039] It is possible, according to the invention, as shown in Fig. 10, to provide an additional free wheel (s) 42 at each suitable location of the multi-step transmission, for example, between a shaft and the housing G or possibly to connect two shafts.

[040] It is also possible by means of the design, as shown in Fig. 13, to arrange the input shaft and the output shaft, preferably for transverse wheel drive, front

wheel drive, longitudinal wheel drive, rear longitudinal wheel drive or all wheel drive arrangements on the same side of the transmission or the housing G. On the side of the input shaft or on the side of the output shaft, in addition, an axle differential and/or an inter-axle differential 20 can be arranged, as shown in Fig. 4.

[041] Within the scope of an advantageous further development, as shown in Fig. 5, the input shaft 1 can be separated according to need by means of a coupling or clutch element 24 from a driving motor or prime mover 30, wherein a hydraulic clutch, a hydrodynamic converter, a hydraulic coupling, a dry starting clutch, a wet starting clutch, a magnetic powder clutch or a centrifugal clutch can be used as the coupling element. It is also possible to arrange such a starting element behind the transmission in the direction of power flow so that, in this case, the input shaft 1 is in permanent connection with the crankshaft 32 of the engine or prime mover 30, as shown in Figs. 6 and 7. Starting can occur also by means of a switch or shift element of the transmission. The brake 04, which is activated in the first forward gear as well as also in the first reverse gear, is preferably used as the starting element.

[042] The multi-step transmission, according to the invention, as shown in Fig. 8, also enables the arrangement of a torsional vibration damper 34 between the engine or prime mover 30 and the transmission.

[043] Within the scope of another embodiment, ~~which is not depicted~~ as shown in Fig. 12, a wear-free brake, such as a hydraulic or electric retarder 44 or the like, can be arranged on each shaft, preferably on the input shaft 1 or on the output shaft 2, which is of particular importance ~~in particular~~ for use in utility vehicles. An auxiliary drive 38 can be provided in addition, preferably on the input shaft 1 or the output shaft 2, in order to drive the additional units 36 on each shaft, as shown in Fig. 9.

[045] A further advantage of the multi-step transmission presented herein consists in that an electric machine 40 can be accommodated on each shaft as a generator and/or as an additional driving machine, as shown in Fig. 11.

1-22. (CANCELED)

23. (CURRENTLY AMENDED) A multi-step transmission ~~[[in]] of a planetary construction style, in particular an automatic transmission~~ for a motor vehicle, comprising:

- an input shaft (1) and an output shaft (2)[[.]] which are arranged in a housing (G),
- first, second and third ~~spider-supported~~ planetary gear sets (P1, P2, P3),
- at least ~~seven rotatable~~ third, fourth, fifth, sixth and seventh shafts ([[1, 2,]][3, 4, 5, 6, 7]), as well as at least six ~~switch shifting~~ elements (03, 04, 05, 14, 56, 67), brakes and clutches, whose selective ~~meshing effects engagement achieves~~ different gear ratios between the input shaft (1) and the output shaft (2)[[.]] so that seven forward gears and one reverse gear can be realized, drive input occurs by means of the input shaft (1)[[.]] which is ~~[[in]] permanently connected connection with~~ [[an]] a first element of the first planetary gear set (P1); drive output occurs via the output shaft (2)[[.]] which is ~~permanently connected connection~~ with a planet carrier of the second planetary gear set (P2) and a planet carrier of the third planetary gear set (P3); [[a]] the third shaft (3) is ~~[[in]] permanently connected connection~~ with a further element of the first planetary gear set (P1); [[a]] the fourth shaft (4) is ~~[[in]] permanently connected connection~~ with a ring gear of the second planetary gear set (P2) and a ring gear of the third planetary gear set (P3); [[a]] the fifth shaft (5) is ~~[[in]] permanently connected connection~~ with a sun gear of the third planetary gear set (P3); [[a]] the sixth shaft (6) is ~~[[in]] permanently connected connection~~ with a ring gear of the first planetary gear set (P1); [[a]] the seventh shaft (7) is connected to a sun gear of the second planetary gear set (P2); the third shaft (3) can be coupled to the housing (G) by means of a ~~[[third]] first~~ brake ([[05]]03); the fourth shaft (4) can be coupled to the housing (G) by means of a second brake (04); the fifth shaft (5) can be coupled to the housing (G) by means of a third brake (05); a first clutch (14) detachably connects the input shaft (1) and the fourth shaft (4) ~~to each~~ with one another; a second clutch (56) detachably connects the fifth shaft (5) and the sixth shaft (6) ~~to each~~ with one another; and a third clutch (67) detachably connects the sixth shaft (6) and the seventh shaft (7) ~~to each~~ with one another.

24. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the input shaft (1) is ~~[[in]] permanently connected connection~~ with the planet carrier of the first planetary gear set (P1)~~[[,]]~~ and the third shaft (3) is ~~[[in]] permanently connected connection~~ with a sun gear of the first planetary gear set (P1).

25. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the input shaft (1) is ~~[[in]] permanently connected connection~~ with a sun gear of the first planetary gear set (P1)~~[[,]]~~ and the third shaft (3) is ~~[[in]] permanently connected connection~~ with a planet carrier of the first planetary gear set (P1).

26. (CURRENTLY AMENDED) The multi-step transmission of one of the claim 23, wherein the first planetary gear set (P1) and the third planetary gear set (P3) are ~~configured as a plus~~ positive planetary gear sets, and the second planetary gear set (P2) is ~~configured as a minus~~ a negative planetary gear set.

27. (PREVIOUSLY PRESENTED) The multi-step transmission of claim 26, wherein the second planetary gear set (P2) and the third planetary gear set (P3) are combined as a Ravigneaux planetary gear set with a common planet carrier and a common ring gear.

28. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein ~~a free wheels can be used in every suitable location~~ is located within the multi-step transmission.

29. (CURRENTLY AMENDED) The multi-step transmission of claim 28, wherein the multi-step transmission has a free wheel~~[[s are]]~~ provided between at least one of the at least seven rotatable the input shaft, the output shaft, the third, the fourth, the fifth, the sixth and the seventh shaft~~[[s]]~~ (1, 2, 3, 4, 5, 6, 7) and the housing (G).

30. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the input shaft (1) and the output shaft (2) are provided on a same side of the housing.

31. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein at least one ~~or more~~ of an axle differential and inter-axle differential is arranged on one of ~~[[the]]~~ an input side or ~~[[the]]~~ an output side of the multi-step transmission.

32. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the input shaft (1) ~~can be~~ is separated from a drive motor by means of a coupling prime mover by a clutch element.

33. (CURRENTLY AMENDED) The multi-step transmission of claim 32, wherein the ~~coupling clutch~~ element is one of a hydrodynamic converter, a hydraulic clutch, a dry starting clutch, a wet starting clutch, a magnetic power clutch[[, or]] and a centrifugal clutch.

34. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein an external starting element is ~~arranged behind~~ located in a power flow direction downstream of the multi-step transmission in a direction of power flow, while the input shaft (1) is fixedly connected to a crankshaft of ~~the engine~~ a prime mover.

35. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein starting occurs by ~~means of a switch~~ engagement of one of the at least six shifting elements (03, 04, 05, 14, 56, 67) of the multi-step transmission[[,]] while the input shaft (1) is [[in]] permanently connected ~~connection~~ with a crankshaft of ~~the engine~~ a prime mover.

36. (CURRENTLY AMENDED) The multi-step transmission of claim 35, wherein one of [[a]] the first brake (03) [[or]] and the second brake (04) ~~can be~~ is used as the shifting switch element for starting the multi-step transmission.

37. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein a torsional vibration damper ~~can be arranged~~ is located between ~~an engine~~ a prime mover and the multi-step transmission.

38. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein ~~a wear-free brake can be arranged on each shaft~~ one of the input shaft (1) and the output shaft (2) has a retarder.

39. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein an auxiliary drive ~~can be arranged on each shaft~~ is located one at least one of the input shaft, the output shaft, the third shaft, the fourth shaft, the fifth shaft, the sixth shaft and the seventh shaft (1, 2, 3, 4, 5, 6, 7) in order to drive an additional unit[[s]].

40. (CURRENTLY AMENDED) The multi-step transmission of claim 39, wherein [[an]] the auxiliary drive ~~can be arranged~~ is located on one of the input shaft (1) [[or]] and on the output shaft (2).

41. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the shifting switch elements are ~~configured as~~ one of power-shift clutches or brakes.

42. (CURRENTLY AMENDED) The multi-step transmission of claim 41, wherein the shifting switch elements (03, 04, 05, 14, 56, 67) are one ~~or more~~ of multi-plate ◆◆
clutches, band brakes, and cone clutches.

43. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein the shifting switch elements (03, 04, 05, 14, 56, 67) are one ~~or more~~ of positive locking ◆◆
brakes and clutches.

44. (CURRENTLY AMENDED) The multi-step transmission of claim 23, wherein an electric machine [[can be]] is accommodated on ~~each shaft~~ at least one of the input ◆◆
shaft, the output shaft, the third shaft, the fourth shaft, the fifth shaft, the six shaft and ◆◆
the seventh shaft (1, 2, 3, 4, 5, 6, 7) as one ~~or more~~ of a generator and as [[a]] an ◆◆
auxiliary driving machine.